REMARKS

Claims 1-60 are pending. The Applicant appreciates that the Examiner has indicated that certain claims (5, 6, 8-11, 17, 25, 27-30, 33, 34, 45, and 53) are directed to allowable subject matter. However, claims 1-4, 7, 12-16, 18-24, 26, 31, 32, 35-44, 46-52, and 54-60 stand rejected under the Office Action dated April 15, 2008, as allegedly obvious over a combination of three references. Claim 57 is rejected as allegedly directed to non-statutory subject matter. In view of the present amendments to claims 57-60 and the arguments presented below, these rejections should be withdrawn, and all of the pending claims allowed.

Claim Rejections – 35 U.S.C. § 101

Claim 57 stands rejected under 35 U.S.C. § 101 as allegedly directed to non-statutory subject matter. Claims 57-60 have been amended so that it is directed to computer readable media encoded with a set of computer-executable instructions. As amended, the claims are directed to computer readable media encoded with a data structure, and thus define structural and functional interrelationships between the data structure and the computer software and hardware. Claims 57-60, as amended, are directed to statutory subject matter and the present rejection should be withdrawn.

Claim Rejections – 35 U.S.C. § 103

Claims 1-4, 7, 12-16, 18-24, 26, 31, 32, 35-44, 46-52, and 54-60 are rejected under 35 U.S.C. § 103(a) as allegedly obvious over Fitton et al. (US 2004/0028013) in view of Smee et al. (US 6,990,137) and further in view of Grant et al. (US2005/0195889). Applicant notes that the present rejections are similar to those presented in two previous office actions dated December 14, 2006 and November 1, 2007, except that the Grant reference has been added to the present rejections, apparently to supply the missing teaching of "impairment correlations."

Adding the Grant reference does not cure the deficiencies of the previous rejections. A fundamental problem with the previous rejections is that the teachings of Fitton and Smee cannot be combined to yield the claimed invention, as neither reference teaches or suggests the derivation of a final impairment correlation matrix from first and second impairment correlation matrices. Adding the teachings of Grant, does not solve this problem. Furthermore, the present rejections appear to ignore the clarifying amendments made in a previous response. Finally, the present Office Action utterly fails to offer a rationale for why a person of ordinary skill in the art would combine the limited teachings of the cited references in the manner claimed by the present invention. In fact, the cited combination of references does not disclose or suggest the invention as claimed. The present rejections are improper, and should be withdrawn.

The invention relates to a method and apparatus for estimating impairment correlation matrices in a spread spectrum receiver. An impairment correlation estimator estimates first and second impairment correlation matrices based on despread symbols and then derives a final impairment correlation matrix based on the first and second impairment correlation matrices. In one exemplary embodiment, the impairment correlation estimator selects one of the first and second impairment correlation matrices. In other embodiments, the impairment correlation estimator combines the first and second impairment correlation matrices to generate the final impairment correlation matrix.

Claims 1 and 21 stand rejected as allegedly obvious over Fitton et al., in view of Smee and Grant. However, none of the cited references teach or suggest combining or selecting between first and second impairment correlation matrices to derive a final impairment correlation matrix as recited in the claims.

The application to Fitton et al. discloses an interference canceling RAKE receiver that cancels interference from the received signal prior to dispreading. The interference canceling receiver generates estimates of interfering symbols, re-spreads the interfering symbols to

generate interference estimates, and subtracts the interference estimates from the received signal. There is no mention in Fitton of impairment correlations.

The present Office Action asserts that Fitton teaches "estimating a first correlation based on despread symbols received over multiple paths of a multi-path channel, estimating a second correlation based on the despread symbols, and deriving a final correlation based on the first and second correlation." (Office Action, p. 3, internal citations removed.) The Office Action admits that Fitton's "correlations" are not in the form of matrices. (*Id.*) The Office Action further admits that Fitton fails to disclose impairment correlations. (*Id.*) In addition, as was pointed out in two previous responses, the alleged "estimating a first correlation" and "estimating a second correlation" operations in Fitton are not based on despread symbols. Rather, the cited teachings of Fitton describe well-known Rake finger operations that produce despread symbols from multipath components of a spread spectrum signal. (*See* Fitton, Fig. 5, numbers 514 1-N, and ¶ [0093].) Furthermore, in the receiver circuit described by Fitton, cross-code interference is suppressed before these Rake finger operations are performed.

Thus, even if it is granted that Fitton's plurality of Rake fingers comprise a plurality of correlation operations, these Rake fingers are not operable to estimate a first (or second) correlation matrix. Further, these Rake fingers are not operable to estimate impairments, impairment correlations, or impairment correlation matrices. Still further, these Rake fingers are not operable to estimate anything at all based on despread symbols. Finally, these Rake fingers are completely unrelated to any impairment processing at all. Accordingly, even if it is granted that Fitton's Rake fingers are correlators, Fitton can only be said to disclose a plurality of correlation operations that produce despread multipath components of a spread spectrum signal. These despread multipath components are in fact the despread symbols that are used by the present invention to obtain the first and second impairment correlation matrices. The

correlation process described in Fitton is not based on despread symbols, nor does it produce impairment correlation matrices (or matrices of any sort).

When the teachings of Fitton are properly understood, it is clear that they cannot be combined with the teachings of Smee or Grant to produce any of the features of the present invention. According to the Office Action, "Smee teaches wherein the correlation is the correlation matrix." (P. 3.) In fact, Smee teaches a completely distinct correlation process that produces a correlation matrix that differs fundamentally from any quantity or signal disclosed in Fitton. Smee teaches a process in which a cross correlation between signals received over multiple antennas is computed. From these cross correlations, a noise correlation matrix is computed. The noise correlation matrix is used to compute combining weights. (Smee, col. 22, lines 23-65.) Thus, the correlation matrix in Smee is completely distinct from the Rake finger processing of Fitton. The Office Action does not explain how Fitton's plurality of Rake fingers can be combined with Smee's noise correlation matrix to produce a first correlation matrix based on despread symbols, or to produce a second correlation matrix based on the despread symbols, or to derive a final correlation matrix.

The Office Action admits that the combination of Fitton and Smee fails to teach that "the correlation is the impairment correlation." (Office Action, pp. 3-4.) The Office Action provides Grant in an effort to correct this deficiency. Grant discloses the use of an impairment correlation for use in a wireless receiver. Grant's impairment correlation matrix, like Smee's noise correlation matrix, is used to produce combining weights for further processing of a received signal. However, for the same reasons as above, the teachings of Fitton and Smee cannot be combined with the teachings of Grant to obtain the claimed invention. Fitton's plurality of Rake fingers (which allegedly produce first and second correlations) cannot be modified, using the teachings of Smee and Grant, to produce impairment correlation matrices. None of the prior art references cited by the examiner disclose selection or combining of multiple impairment

correlation matrices to obtain a final impairment correlation matrix. Thus, the combination does not teach or suggest "deriving a final impairment correlation matrix based on the first and second impairment correlation matrices," as recited by claim. The cited combination of references does not disclose, or even remotely hint at the presently claimed invention.

The Applicant's above arguments are bolstered by the fact that the Office Action fails utterly to articulate a rationale explaining why a person of ordinary skill in the art would combine the references to obtain the claimed invention, as required by the current law and Patent Office guidelines. (*See* Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in View of the Supreme Court Decision in KSR International Co. v. Teleflex Inc., 72 Fed. Reg. 57526 et seq.) As noted in those guidelines, the Supreme Court has stated that "Rejections on obviousness cannot be sustained by mere conclusory statements; instead there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." (*Id.* at 57528-29.) The present Office provides only conclusory statements, declaring that it would have been obvious to "provide the teaching of Smee into the system of Fitton in order to trade off noise suppression through averaging and ability to track channel variation" and that it would have been obvious to combine the teachings of all three references "in order to detect the signal of interest within the received composited signals." (Office Action, pp. 3-4.) The latter assertion merely recites a goal of virtually any wireless receiver, "to detect the signal of interest," and provides no explanation at all for why a skilled practitioner would combine the three references in the manner claimed. The former assertion similarly explains nothing at all – it is not clear at all that the cited combination would in fact "trade off noise suppression through averaging and ability to track channel variation." These statements are not rationales for combining the references, but merely conclusory statements. Applicant submits that the reason the Office Action fails to supply a proper rationale for

combining the references in the manner claimed by the present application is that the references cannot be combined to obtain the claimed invention.

In view of the current claim amendments and the above arguments, it is respectfully urged that the present application is in condition for allowance.

Respectfully submitted,

COATS & BENNETT, P.L.L.C.

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Daniel P. Homiller
Registration No.: 55,275

1400 Crescent Green, Suite 300
Cary, NC 27518
Telephone: (919) 854-1844
Facsimile: (919) 854-2084